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**MOSQUITO LARVICIDAL ACTIVITY OF SELECTED PLANT  
EXTRACTS AND ISOLATION OF ACTIVE INGREDIENT  
FROM *Pagianta dichotama***

A PROJECT REPORT PRESENTED BY

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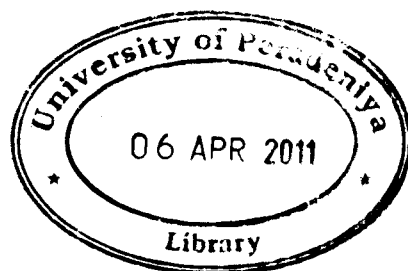
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EXTRACTS AND ISOLATION OF ACTIVE INGREDIENT  
FROM *Pagiantha dichotama***

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**ABSTRACT**

The objectives of this study is to evaluate the mosquito larvicidal activity of selected Sri Lankan plants, *Aleurites moluccana* (Thel Kakuna), *Artocarpus nobilis* (Waldel), *Ceasalpinia bonduc* (Kuburu), *Pagiantha dichotama* (Divikaduru), *Operculina turpethum* (Thiraswalu), *Toona ciliata* (Toona), *Aegle marmelos* (Beli) and *Acronychia pedunculata* (Ankenda) and to investigate the active compounds of *P. dichotama* against mosquito larvae.

Extracts of different parts of *A. moluccana*, *A. nobilis*, *C. bonduc*, *P. dichotama*, *O. turpethum*, *T. ciliata*, *A. marmelos* and *A. pedunculata* were tested for mosquito larvicidal activity against Sri Lankan strain of *Culex quinquefasciatus* following WHO protocols. *Pagiantha dichotama* was selected for further investigation and isolation of larvicidal compounds were carried out using ethanol extract of *P. dichotama*. Dry Column Flash Chromatography (DCFC) and Column chromatography were used in fractionation and isolation of active compounds from extracts of *P. dichotama*

Of plants extracts tested, ethanol extract of stem bark, fruit and leaves of *P. dichotama* showed highest mosquito larvicidal activity against *Cx. quinquefasciatus* at concentration of 200 ppm. Of these, leaves extract of *P. dichotama* showed the highest mosquito larvicidal activity (100%) followed by stem bark and fruit extracts (97 %). In our bio-assays, good mosquito larvicidal activity was showed by the ethanol extract of *O. turpethum* (97 %), seed of *C. bonduc* (81 %), leaves of *C. bonduc* (77 %), stem of *C. bonduc* (75%), stem bark of *A. marmelos* (81 %) and stem bark of *A. pedunculata* (75%) against *Cx. quinquefasciatus* at 200 ppm concentration. This is the first record of mosquito larvicidal activity of different plant parts of extracts of *P. dichotama*, *C. bonduc*, *O.*

*turpethum*, *A. marmelos*, and *A. pedunculata* against Sri Lankan strain of *Cx. quinquefasciatus*. Total ethanol extracts of flowers and fruits of *A. moluccana*, leaves of *T. ciliata* and stem bark of *A. nobilis* do not exhibit good mosquito larvicidal activity against *Cx. quinquefasciatus* at tested concentration of 200 ppm. Sequential extracts of stem bark of *A. nobilis* do not show any mosquito larvicidal activity at tested concentration.

TLC finger print analysis showed seven prominent compounds that can be found in stem bark extract, eight prominent compounds in fruit extract and seven prominent compounds in leaves extract of *P. dichotama*. Bio-assay guided fractionation of leaves extract of *P. dichotama* by DCFC on silica gel H and eluting with a gradient solvent system of hexane and ethyl acetate afforded seven fractions. Fraction F<sub>2</sub> showed four major compounds, F<sub>3</sub> three major compounds, F<sub>4</sub> four major compounds, F<sub>5</sub> two major compounds, F<sub>6</sub> three major compounds and F<sub>7</sub> three major compounds. Fractions F<sub>5</sub> and F<sub>6</sub> showed the highest activity of 100% mortality.

The fraction F<sub>5</sub> and F<sub>6</sub> obtained from the DCFC column were combined and subjected to column chromatography on silica gel 60 eluting with a gradient solvent system of hexane and ethyl acetate to obtain thirty two fractions. Analytical TLC indicated that fractions F<sub>2</sub> (Compound 1), F<sub>17</sub> (Compound 2) and F<sub>19</sub> (Compound 3) contained single compounds. TLC finger print analysis of compound 1, 2 and 3 with fractions F<sub>5</sub> and F<sub>6</sub> obtained from DCFC indicated that compound 1 is the first spot ( $R_f = 0.66$ ) of F<sub>5</sub> and compound 2 and 3 are close analogues and are the second spot ( $R_f = 0.43$ ) of F<sub>6</sub>.

This study reveals that extracts of *P. dichotama*, *O. turpethum*, *C. bonduc*, *A. marmelos* and *A. pedunculata* used as medicinal plants in Sri Lanka showed very good mosquito larvicidal activity against *Cx. quinquefasciatus* and requires further investigations to find active ingredients. Three compounds, 1, 2 and 3 obtained from bio-assay guided isolation of leaves extract of *P. dichotama* requires NMR spectroscopic studies for structure elucidation of compounds. Active extract and compounds may have potential to be developed as mosquito larvicides after toxicological evaluations for vertebrates, including humans and eco-toxicological evaluations and commercial feasibility studies.